



University of Mauritius



Institut für  
Textiltechnik und  
Lehrstuhl für  
Textilmaschinenbau



## WasteDrive

<b>Project title:</b>	Development of a fiber-reinforced electric scooter based on high-performance natural fibers from agricultural waste products	<b>Univ.-Prof.</b> <b>Prof. h.c. (Moscow State Univ.)</b>
<b>Project partners:</b>	Institut für Textiltechnik of RWTH Aachen University, Aachen, Germany  University of Dar es Salaam, Daressalam, Tanzania  University of Mauritius, Mauritius	<b>Dr.-Ing. Dipl.-Wirt. Ing.</b> <b>Thomas Gries</b>  Institute Director  <b>Ben Vollbrecht</b>  Research Scientist
<b>Term:</b>	06/2021 – 05/2025 (Modul 1)  01/2021 – 12/2024 (Modul 2)	<b>01.06.2021</b>
<b>Funding programme :</b>	Partnerships for Sustainable Solutions with Sub-Saharan Africa 2021-2024  <i>Module 1: Federal Ministry of Education and Research (BMBF)</i> <i>Module 2: German Academic Exchange Service (DAAD)</i>	

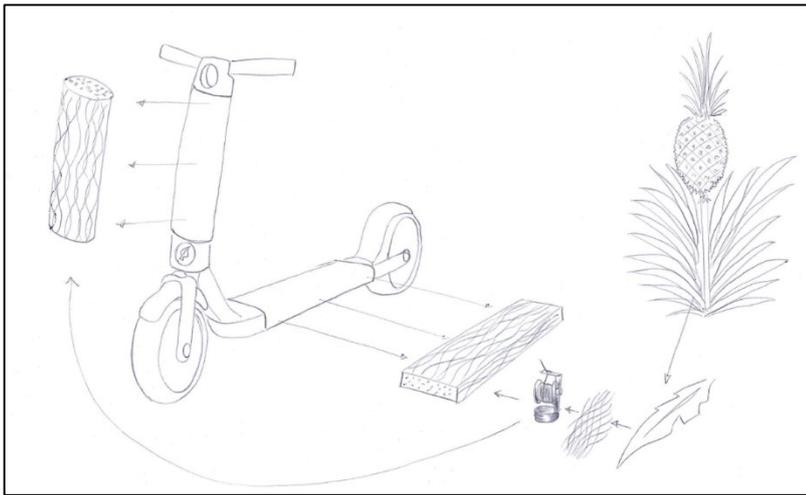
## Mission Statement

This joint project enables a worldwide unique cooperation of three national leading universities to establish the first 'African Bio Composite Research Center'. The aim is to develop a research center based at the University of Dar es Salaam into one of the hubs of biocomposite development on the African continent in the long term. Thematically, the research project deals with the development of recyclable bio-composites based on recycled natural fibers. These fibers are obtained from waste products of the local food industry. In contrast to the glass fiber industry, which has access to a raw material that is equally distributed worldwide, the African location has a decisive advantage - access to a highly innovative raw material that, as a waste product, has not been subject to any further use up to now. Currently, for lack of alternatives, the valuable material is burned two to three times a year, depending on the end of the harvest. Unlike the production of jute or sisal, which have a negative impact on the soil, no additional agricultural land is blocked and a valuable material is created that offers a clear cost advantage compared to fibers grown in-house. The project consists of two modules, the research module (module 1) and the post-graduate education and training module (module 2), which together form a project unit.



## Solution

The mobility problem that already exists in Germany is reflected in the contradiction between environmental friendliness and the desire for individual transportation. As in all industrialized countries of the



world, young people in Africa will also be drawn to large cities in the medium and long term. The associated African mobility problem is therefore based on the same advancing urbanization, which is overwhelming conventional mobility concepts. Consequently, there is a huge demand for sustainable urban transport concepts, such as electric scooters for the growing African middle class. In Europe, there are already sharing providers of electric scooters in every mid-sized city to

cover short distances within the city. In order to start this development in the African region, this project will focus on ensuring that future electric scooters have an ecological environmental balance in an economical manufacturing process and that green lightweight electric scooters become an unrivaled substitute product. A transfer of the results to oil palm leaf fibers, coconut fibers, banana leaf fibers is possible, resulting in an Africa-wide market of about 1 billion € on fiber level from existing waste materials alone.

For the qualification of the graduates, a curriculum and the teaching material for a seminar series will be developed during the term, which deals with material development on fiber, textile, composite and component level (Modul 2). The seminar series consists of a combination of lecture and practical training, which consolidates the learned contents. The elaboration of the practical part, is done by a close integration with the research from module 1 and include the entire process chain from the production of the fiber material, to the processing, to the production of an electric scooter as a demonstrator. The concept developed in this way is tested in annual "Summer Schools" and evaluated in joint workshops between the participating research partners. In addition to quality assurance of the seminar, the workshops serve to conceptualize the lecture, to elaborate learning content according to the iPodia concept and to exchange research data from module 1. The latter enables the transfer of current results (e.g. workshop on the infusion of fiber-based reinforcement structures) between the fields of industry as well as teaching and research.

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